

REMARKS/DISCUSSION OF ISSUES

Claims 1-13 are pending in the application. Claims 8-13 are allowed. Claims 1-7 are rejected.

Claims 1 and 2 are rejected under 35 USC 103(a) as being unpatentable over Silverstein et al. (U.S. 6,714,350 B2) (herein 'Silverstein') in view of Nakabayashi (U.S. 6,523,963 B2) and Nakano et al. (JP410208284) (herein 'Nakano').

Silverstein discloses a double-sided wire grid polarizer which is said to have a number of advantages over single-sided wire grid polarizers, such as improved thermal stability (col. 12, lines 35 et seq., and improved contrast in an optical system (col. 13, lines 8 et seq.).

Silverstein does not mention any concerns regarding chemical instability of the wire grids, nor does he provide any protection of the wire grids from the ambient environment.

Nakabayashi is cited to show a transparent cover sheet surrounding an optical element and sealed to a substrate, referring specifically to Fig. 1B and col. 3, lines 66-67, and col. 4, lines 1-7.

Nakabayashi's optical element is a diffraction grating with a stacked structure composed of stacked diffraction optical elements with a minute gap between them. The space is hermetically sealed to prevent moisture from entering and changing the refractive index of the stacked structure due to changing environmental conditions over time. Col. 3, lines 17-24.

Nakabayashi's diffraction optical elements are fabricated from resin. See, e.g., col. 3, line 59. Nakabayashi does not teach or suggest the use of wire grid polarizers, nor does he

teach or suggest that his resin grids are themselves chemically unstable in an air environment. On the contrary, the term 'air gap' is used to describe the hermetically sealed space. Col. 4, line 5.

Thus, not only does Nakabayashi fail to teach or suggest the need to protect a polarizing grid from the ambient, he actually teaches away from such a result by teaching that air is sealed into the gap between grids, not removed from the gap.

Moreover, Silverstein's double-grid element has no gap between the grids, since the grids are positioned on opposing sides of a common substrate. Thus, Nakabayashi's motive for providing a hermetic seal, i.e., to eliminate changes in moisture content of the gap, is not applicable to Silverstein's device, and there is no motivation for the skilled artisan to provide such a protective cover.

Even if a protective cover were provided in accordance with the teachings of Nakabayashi, it would not provide protection of the grids from the ambient, since the ambient would be sealed in, not out.

Nakano is cited to show an enclosure with a non-reactive atmosphere to protect an optical element, specifically referring to Fig. 1 and lines 10-12 of the English Abstract.

Nakano discloses an optical head for a disk drive, including a semiconductor laser (21), and an optical element (22) with a polarizing film (30) formed in the upper surface of the optical element. The optical head is hermetically sealed in a housing (41,42,43) containing an inert gas such as nitrogen, to insure that the power emitted by the laser is not adversely affected by changes in the relative humidity of the ambient. See the English Abstract.

Nakano does not teach or suggest that the polarizing film requires a non-reactive atmosphere. On the contrary, Nakano teaches that the hermetic seal is provided for the optical element (22). Moreover, the hermetic seal is provided to eliminate changes in the relative humidity (moisture content) of the ambient surrounding the optical element (22), not to protect the polarizing element.

Silverstein has no optical element comparable to Nakano's element (22), and since neither Silverstein nor Nakano teach or suggest any reason to protect the polarizing element per se, there is no motivation for the skilled artisan to provide a hermetically sealed enclosure for Silverstein's device.

Moreover, Applicant's Claim 1 specifically calls for the polarizer to be isolated by means of a cover sheet sealed to the polarizer's optically transparent substrate, and Nakano does not teach or suggest a cover sheet sealed to the substrate of the polarizer.

Furthermore, since Nakano's reason for hermetically sealing the optical element (22) is to control the relative humidity, his enclosure could have contained air (like Nakabayashi's enclosure) instead of nitrogen, and still have achieved the desired result.

Accordingly, there is no motivation provided by the references for the skilled artisan to provide a non-reactive atmosphere for Silverstein's device, and it is urged that the rejection is in error and should be withdrawn.

Claims 3 and 4 are rejected under 35 USC 103(a) as being unpatentable over Silverstein in view of Nakabayashi and Nakano as applied above, and further in view of Ray et al. (U.S. 5,701,008) (herein 'Ray').

Ray is cited for the seal (8) which it is argued 'can reasonably be viewed as being equivalent to a plurality of spacers'.

However, seal (8) is a continuous bead of sealant, not discontinuous, as spacers would be. See, e.g., Fig. 2. This difference is significant, since in order to achieve a uniform spacing between the microlenses (col. 4, lines 47, 48), the height of the seal must be precisely controlled (col. 3, line 33).

In contrast, the use of spacers of uniform size in conjunction with a sealant achieves a precise thickness of the seal without the difficulty involved in laying down a continuous bead of sealant of a precise thickness. Thus, seal (8) is neither structurally or functionally equivalent to a plurality of spacers.

Accordingly, it is urged that the rejection of claims 3 and 4 is in error and should be withdrawn.

Claims 5-7 are rejected under 35 USC 103(a) as being unpatentable over Herren et al. (U.S. 6,795,260 B2) (herein 'Herren').

Herren is cited to show a sealable housing with top and bottom portions and three face portions extending between the top and bottom portions to form a wedge-shaped enclosure, referring specifically to Fig. 3.

However, the housing is neither sealable nor wedge-shaped. As shown in Fig. 3, for example, it comprises an extension (12) which is open on one side and defines a plurality of apertures (19) on at least three other sides which are not intended for receiving optical elements. Thus, even after inserting optical elements into the apertures (14.1, 14.2, 14.3, 14.4), open areas remain.

This open structure is consistent with the objective of producing a light-weight structure suitable for use in space. Such structures are to be contrasted with closed box structures which form a closed envelope said to be heavy and thermally unstable. Col. 1, line 61 through col. 2, line 10.

Thus, Herren not only fails to teach or suggest a sealable, wedge-shaped enclosure, he actually teaches away from such a structure.

Regarding Applicant's further claim limitations relating to the shape of the sides of the enclosure, the Examiner argues that such limitations constitute a matter of design choice, and an obvious modification of Herren's structure.

However, the test for patentability under Section 103 is whether the claimed invention would have been obvious to the skilled artisan in view of the teachings of the cited reference. It is well-settled that under this test, there must be something in the reference itself which at least suggests the required modification.

In the present case, not only does Herren fail to teach or suggest a sealable, wedge-shaped enclosure, He actually teaches away from such a structure, for the reasons already stated. By logical extension, Herren cannot be construed to offer any guidance on refinements to a structure which he has rejected outright as unsuitable for his purposes.

Accordingly, it is urged that the rejection is in error and should be withdrawn.

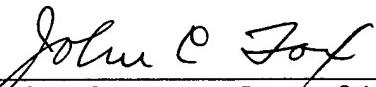
The allowance of claims 8-13 is noted with appreciation. However, in view of the foregoing arguments, Applicant believes that all of the claims are in allowable form, and respectfully requests that the Examiner withdraw the rejection of record,

Amendment/Response

Reply to non-FINAL Office action of 30 November 2004

allow all the pending claims, and find the application to be in condition for allowance.

Respectfully submitted,

  
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